

School Building Survey

Overview

In this activity, students investigate the construction of their school, the fuels the school uses to meet its energy needs, the amount of energy the school uses, and the ways that the school's energy consumption is managed and controlled. The students then brainstorm and recommend ways that the school can save energy.

LEVEL

Grades 7–12

SUBJECT

ENERGY CONSUMPTION:
Investigating the school's energy systems.

CONCEPTS

- Schools use a lot of energy to produce a safe, comfortable learning environment.
- Many factors determine the amount of energy a school uses.
- Schools can reduce energy consumption by converting older systems to energy efficient technologies, instituting energy conservation measures, and educating students, administrators and staff.
- Reducing energy use saves schools money that can be used for other programs and helps protect the environment.

SKILLS

- Investigation & Research
- Critical Thinking
- Presentation

OBJECTIVE

To conduct an energy survey of the school building.

MATERIALS

Flicker Checker

TIME

Two–Four class periods

Background

Schools use a lot of energy to create a safe, comfortable and productive environment for students to learn. Schools use energy to maintain comfortable temperatures, produce light, heat water, cook food, operate vehicles, and run hundreds of electrical machines and appliances—televisions, public address systems, scoreboards, computers, alarm systems, exit signs, etc.

Most of the energy consumed by schools is supplied by electricity (68 %) and natural gas (18 %).

When an energy survey of a building is conducted, four main areas are included:

Building Envelope

The building envelope is the physical structure—the walls, windows, roof, doors, floor, stairwells, and outside environment. The design and construction of the building envelope is a major factor in heating, cooling, and lighting costs.

Heating/Cooling Systems

Heating and cooling the building is the largest single expense of the school. Most schools are heated with natural gas, some with electricity or heating oil. Electricity is usually used for cooling. Maintenance and temperature control of these systems can make a significant impact on energy costs.

Water Heating

Water heaters provide hot water for classrooms, lavatories, showers, laboratories, snack bars and kitchens. They are usually fueled by natural gas or electricity. Insulation, maintenance, and control of temperature and water flow can reduce energy costs for the school.

Lighting

Electricity is used to provide artificial lighting to classrooms, gyms, auditoriums, corridors, offices, sports fields, and parking areas. Maximizing the use of natural light and installing efficient fluorescent lighting systems can significantly reduce energy costs. Controlling light intensity, turning off unnecessary lights, and proper system maintenance can also make an impact on lighting costs for the school.

Getting Ready

- Obtain permission to conduct the survey, if necessary. Ask the administration to make available the information students will need in the General Information section and schedule appointments for the students.
- If the school system has a building superintendent, arrange for a presentation to introduce the activity.
- Arrange for the assistance of the maintenance crew to survey heating/cooling systems.

Doing the Activity

Step One

GO TO PAGES 18–19 OF THE STUDENT GUIDE. Discuss the ways that schools use energy and the types of energy used.

Take a walking tour of the building and grounds, focusing on energy-related items.

Step Two

Divide the students into six groups, assigning tasks as follows:

- 1 Draw a blueprint of the school and grounds—indicating boilers, meters, etc.
- 2 General Information
- 3 Building Envelope
- 4 Heating/Cooling Systems
- 5 Water Heating
- 6 Lighting

Give groups the time frame in which to complete their assigned tasks and the contact people in the school who will assist them.

Step Three

Have groups prepare and present their findings to the class, using the blueprint when necessary. Discuss the findings and brainstorm ways to conserve energy. Draw up a list of recommendations for conserving energy.

Step Four

Evaluate student performance using ability to work as a group, completion of assignment, presentation, and individual participation in the development of recommendations.